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# A New Species of *Oxalis* (Oxalidaceae) from El Salvador

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**ABSTRACT.** *Oxalis salvadorensis*, a new species from the mixed lowland forests of western El Salvador, is described. An illustration is provided, and the differences between this and other morphologically similar Mesoamerican species of *Oxalis* are discussed.

**Key words:** El Salvador, Mesoamerica, Oxalidaceae, *Oxalis*.

The genus *Oxalis* L. consists of around 500–800 species, mainly herbs, often with underground bulbs or tubers, distributed worldwide. Current estimates of the number of species of *Oxalis* cover a large range and highlight the need for research on species delimitation and relationships in this group. In his comprehensive treatment of the family Oxalidaceae, Knuth (1930) recognized 7 genera in the family, of which *Oxalis* was by far the largest with 791 species. In his subgeneric classification, Knuth divided *Oxalis* into 37 sections, based principally on habit and leaf characters; his treatment is the only worldwide subgeneric classification of the genus. Since publication of Knuth's work, research on *Oxalis* has largely consisted of traditional taxonomic revisions of Knuth's sections (for example, Eiten, 1963; Denton, 1973; Lourteig, 1975, 1979). More recently, Lourteig (1994, 1995, 2000) has revised the American species of the genus and has provided a comprehensive new subgeneric and sectional classification.

While preparing a treatment of Oxalidaceae for *Flora Mesoamericana*, a new species, herein described as *Oxalis salvadorensis*, was found.

***Oxalis salvadorensis*** Sidwell, sp. nov. TYPE: El Salvador. Ahuachapán: P.N. El Imposible, San Benito al N del pie del bajadero de los escobos, 13°49'N, 89°56'W, 19 June 1992, E. Sandoval & F. Chinchilla 453 (holotype, LAGU; isotypes, B, F, MO). Figure 1.

Herba acaulis scaposa bulbo squamoso; foliola terminalia symmetrica obcordata sinu non profundo; foliola lateraliter asymmetrica basiscopo reducto; flores albi; semina lateraliter longitudinaliterque pocata.

Stemless herb, 25–50 cm; bulbs ca. 20 × 20

mm; bulb scales 2–15 × 2.4–22 mm, linear to narrowly triangular, with 1–3 veins converging just short of apex, drying reddish brown, membranous at edges, the margins ciliate. Leaves basal, 1–5 per plant, palmate; petioles 8–32 cm, sparsely pubescent with simple, slender, transparent trichomes 2–5 mm long; leaflets 3, unequal, glabrous, or sparsely pubescent with slender trichomes like those of the petiole, the lamina minutely pitted, especially below; terminal leaflet 30–53(–80) × 32–48(–64) mm, obcordate, symmetrical, the base acute, the apex with rounded lobes 21–35(–66) mm apart, and a shallow sinus 2–5 mm; lateral leaflets 23–35(–62) × 30–40(–100) mm, obcordate, asymmetrical, more elongate acroscopically, the sinus 1–3 mm. Inflorescences umbelliform, with 4–11 flowers; peduncles 11–27 cm; bracts 1.5–2.5 × 0.4–0.6 mm, triangular to narrowly triangular, the apex acute, with scattered oxalate deposits. Pedicels 8–12(–14) mm, glabrous; sepals to 2.5–3 × 0.7–1 mm, linear, the apex obtuse to slightly rounded, with oxalate deposits appearing as scattered orange dots, the margins sparsely ciliate with ciliae ca. 0.5 mm long; petals 8–11 × 3.5–4 mm, white; filaments in two whorls, one whorl ca. 2.5 mm, the other 4–5.5 mm; anthers globose, ca. 0.75 mm long; styles 5, 0.5–0.8 mm or 2.5–3 mm, pubescent, the plants distylous or semi-homostylous(?). Capsules 8–10 × 2–3 mm, ovoid, glabrous, pubescent at apex and on styles; seeds ca. 6 per locule, the surfaces appearing pitted due to the presence of both longitudinal and lateral ridges.

**Distribution.** Known only from mixed lowland forest in the El Imposible National Park in western El Salvador at ca. 700 m.

The species is easily distinguished from other stemless *Oxalis* species in Mesoamerica by the large, clearly asymmetric lateral leaflets with rounded lobes. *Oxalis salvadorensis* is morphologically similar to several other Mesoamerican species: *O. gregaria* (Rose) Knuth (W Mexico), *O. dimidiata* Donnell Smith (Guatemala), *O. debilis* Kunth (Guatemala to Peru), and the widespread and variable *O. latifolia* Kunth s.l. (see Table 1).

Heterostyly is important taxonomically in *Oxalis*,



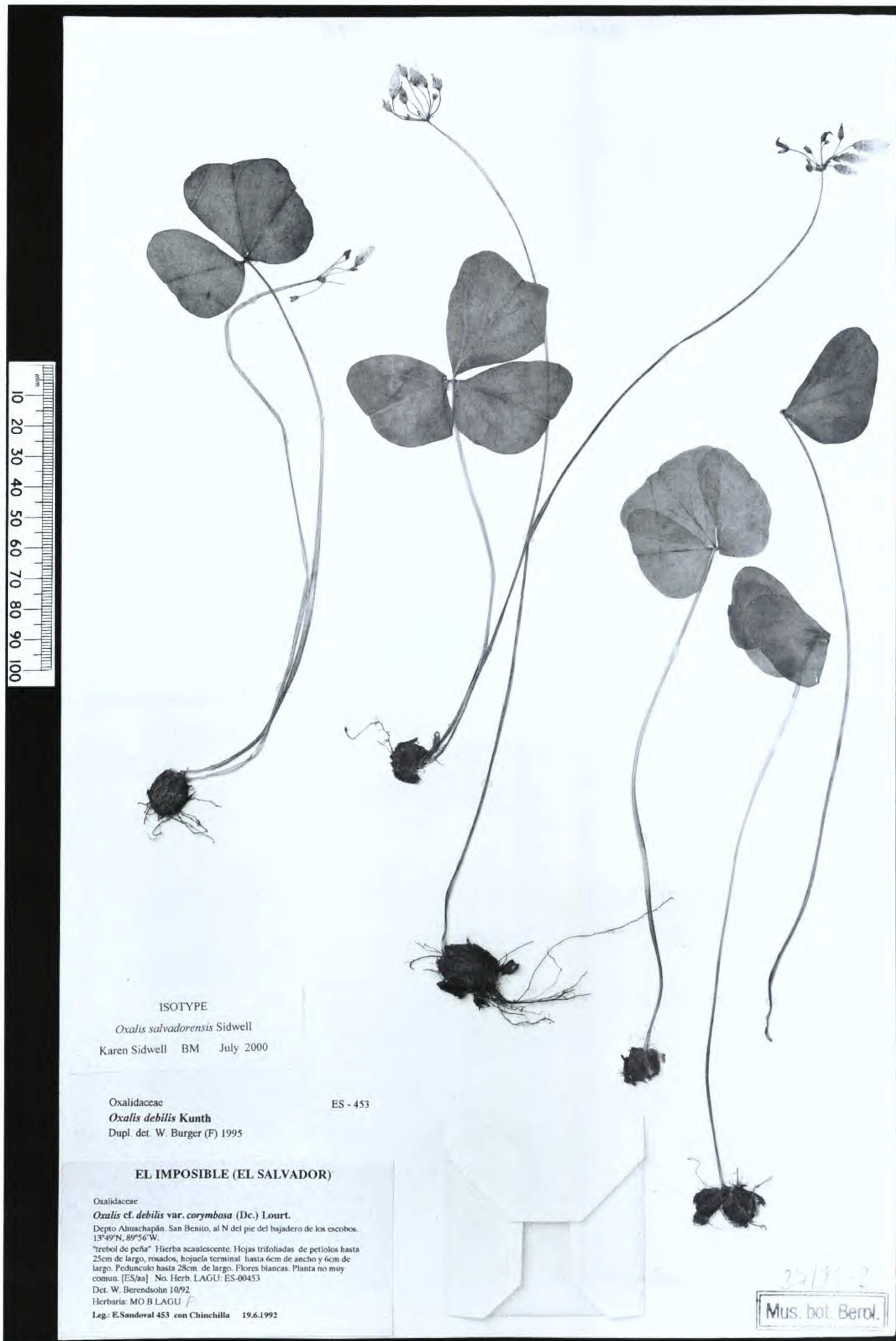


Figure 1. *Oxalis salvadorensis* K. Sidwell. Photograph of the isotype at B.



Table 1. Key differences between *Oxalis salvadorensis* and other similar Mesoamerican and Mexican *Oxalis* species (sect. *Oxalis* subsect. *Dimidiatae* (Knuth) Lourteig and sect. *Ionoxalis* (Small) Knuth). The oxalate deposits at the sepal tips are referred to as "calli" by Lourteig (2000) and Burger (1991).

	<i>Oxalis salvadorensis</i>	<i>Oxalis dimidiata</i>	<i>Oxalis gregaria</i>	<i>Oxalis debilis</i>	<i>Oxalis latifolia</i> s.l.
Sectional membership according to Lourteig (2000)		Section <i>Oxalis</i> subsect. <i>Dimidiatae</i> (Knuth) Lourteig	Section <i>Ionoxalis</i> (Small) Knuth	Section <i>Ionoxalis</i> (Small) Knuth	Section <i>Ionoxalis</i> (Small) Knuth
Elevation	700 m	1200–1450 m	20–1900 m, mossy cliffs	0–1400 m	800–3050 m
Growth form	bulb	scaly rhizome	bulb	bulb	bulb
Leaflet shape and sinus	rounded, shallow	angular, shallow	rounded, deep	rounded, shallow	angular, deep
Lateral leaflet symmetry	asymmetric	asymmetric	asymmetric	symmetric	symmetric
Bracts	glabrous	pubescent	glabrous, margins sparsely ciliate	pubescent	glabrous, margins sparsely ciliate
Oxalate deposits at sepal tips	numerous orange dots	two paired orange "calli"	two paired orange "calli"	two paired orange "calli"	two paired orange "calli"
Flower color	white	lilac	pink	red or pink	lilac, rose, or white
Flower size	8–11 mm	12–13 mm	6–8 mm	8–21 mm	8–20 mm
Capsule length	8–10 mm	to 4 mm	2.5–5 mm	2–6 mm	4–8.5 mm

but it can be difficult to distinguish flower forms on herbarium sheets. Flowers are generally tristylous, distylous, or homostylous; all of these forms, except homostylous, have whorls of stamens of different lengths (see Denton, 1973). The flowers of *O. salvadorensis* appear to be distylous or semi-homostylous (sensu Denton, 1973, where one but not both of the stamen whorls equals the stigma length), but further observations with more specimens and more complete material are needed.

Based on the scapose habit and scaly bulbs, *Oxalis salvadorensis* belongs in *Oxalis* sect. *Ionoxalis* (Small) Knuth. In the recent monograph of *Oxalis* subg. *Oxalis* (Lourteig, 2000), *O. salvadorensis* would key out as belonging to section *Ionoxalis*, and within that section would key near to *O. cuatrecasasii* Lourteig from western Colombia (couplet "Fol. anchamante obcordados o subtriangulares, enteros"; Lourteig, 2000: 534). In the recently completed treatment of Oxalidaceae for *Flora de Nicaragua* (Sullivan, 2001), where *O. salvadorensis* might be expected to occur, it would key out in couplet 1 with *O. latifolia* and *O. debilis*, also members of section *Ionoxalis* (see Table 1). Denton (1973: 488) proposed a putative phylogenetic scheme of relationships for North American taxa in section *Ionoxalis*, in which *O. salvadorensis* might be placed close to her *O. gregaria*-*O. alpina* (Rose) Knuth group. A great deal more taxonomic and phylogenetic investigation is clearly required in these interesting and relatively poorly collected herbs.

*Paratypes.* EL SALVADOR. **Ahuachapán:** P.N. El Imposible, San Benito, 700 m, 13°49'N, 89°56'W, 9 July 1993, E. Sandoval & F. Pérez 1344 (B, F, LAGU, MO), 28 May 1994, F. Chinchilla & J. M. Chinchilla s.n. (B), 23 June 1994, F. Chinchilla s.n. (MO).

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